# Publication list Pieter Koolwijk: full papers 1991- January 2010

#### 2010

Rensing, K.L., Houttuijn Bloemendaal, F.M., Weijers, E.M., Richel, D.J., Büller, H.R., Koolwijk, P., van der Loos, C.M. Twickler, Th.B., von der Thisen, J.H. Could recombinant insulin compounds contribute to adenocarcinoma progression by stimulating local angiogenesis? Diabetologia. 2010, in press

#### 2000

Verloop, R.E., Koolwijk, P., van Zonneveld, A.J., van Hinsbergh, V.W.M. Proteases and receptors in the recruitment of endothelial procenitor cells in neovascularization. European Cytokine Network. 2009. 20:207-19.

Merks R.M.H., Koolwijk, P. Modeling morphogenesis in silico and in vitro: Towards quantitative, predictive, cell-based modeling. Math. Model, Nat. Phenom. 2009. 4:149-171.

Laurens, N., Engelse, M.A., Koolwijk, P., Löwik, C.W., Tarone, G., van Hinsbergh, V.W.M. Role of integrins in tube formation by human endothelial cells in a plasma-derived matrix: interplay between α5β1, ανβ3 and endostatin. **Angiogenesis**. 2009, 12:275-265

van Beem, R.T., Verloop, R.E., Koolwijk, P., van Hinsbergh, V.W.M., Zwaginga, J.J. Blood outgrowth endothelial cells from cord blood and peripheral blood: angiogenesis-related characteristics in vitro: reply to rebuttal **J Thromb Haemost**, 2009, 7: 506–8.

Koutsioumpa, M., Hatziapostolou, M., Mikelis, C., Koolwijk, P., Papadimitriou, E. Aprotinin stimulates angiogenesis and human endothelial cell migration through the growth factor pleiotrophin and its receptor protein tyrosine phosphatase β(ζ, Eur. J. Pharmacol. 2009, 902/245).

van Beem, R.T., Verloop, R.E., Kleijer, M., Noort, W.A., Loof, N., Koolwijk, P., van der Schoot, C.E., van Hinsbergh, V.W.M. Zwaginga, J.J. Blood outgrowth endothelial cells from cord blood and peripheral blood: Angiogenesis-related characteristics in vitro. J Thromb Heemost, 2009, 7217-288.

Plaisier, M., Dennert, I., Rost, E., Koolwijk, P., van Hinsbergh, V.W.M., Helmerhorst, F.M. Decidual vascularisation and the expression of angiogenic growth factors and proteases in first-trimester spontaneous abortions. Hum. Reprod. 2009, 24:185-97.

# 2008

Van der Heijden, M., van Nieuw Amerongen, G.P., Koolwijk, P., van Hinsbergh, V.W.M., Groeneveld, A.B.J. Angiopoietin-2 in permeability edema, acute lung injury and mortality in sepsis and after surgery. **Thorax**, 2008, 63:903-9.

Plaisier, M., Koolwijk, P., Willems, F., van Hinsbergh, V.W.M., Helmerhorst, F.M. Angiogenic growth factors and their receptors in first-trimester human decidua of pregnancies further complicated by pre-eclampsia or fetal growth restriction. Reprod Scl. 2008, 15,720-8.

Plaisier, M., Koolwijk, P., Willems, F., van Hinsbergh, V.W.M., Helmerhorst, F.M. Pericellular-acting proteases in human first-trimester decidua. Mol. Hum. Reprod. 2008;14:41-51.

Van Hinsbergh, V.W.M. and Koolwijk, P. Endothelial sprouting and angiogenesis: matrix metalloproteinases in the lead. Cardiovasc Res. 2008; 78:203-12.

Zerpa, S.F., Vink, S.R., Ruiter, G.A., Koolwijk, P., Peters E., van der Luit, A.H., de Jong, D., Budde, M., Bartelink, H., van Biltterswijk, W.J., and Verheij, M. Alkyhöpspholpisch sinhbit capillary-like endothelial tube formation in vitro: Anti-angiogenic properties of a new class of anti-tumor agents. Anti-Cancer drugs. 2008, 19:65–75.

Engelse, M.A., Laurens, N., Verloop, R.E., Koolwijk P., van Hinsbergh, V.W.M. Differential gene expression analysis of tubule forming and non-tubule forming endothelial cells: CDC42GAP as a counter-regulator in tubule formation. **Angiogenesis**, 2008; 11:153-67.

# 2007

Guimarães, A.H.C., Laurens, N., Koolwijk, P., Weijers, E.M., van Hinsbergh, V.W.M. Rijken, D.C. TAFI and pancreatic carboxypeptidase B (CPB) modulate in vitro capillary tube formation by human microvascular endothelial cells. Arteriosc. Thromb. Vasc. Biol. 2007. 2007.27/2157-2162.

Plaisier, M., Rodriguez, S., Willems, F., Koolwijk, P., van Hinsbergh, V.W.M., Helmerhorst, F.M. Different Degree of Vascularization and its Relation to the Expression of Vascular endothelial growth factor, Placental growth factor, Andiocoletins and their Recentors in 1st Trimester Decidual tissues. Fertility & Sterility. 2007. 88:176-187

Kaijzel, E.L., Koolwijk, P., van Erck, M.G.M., van Hinsbergh, V.W.M. de Maat, M.P.M. Molecular weight fibrinogen variants determine angiogenesis rate in a fibrin matrix in vitro and in vivo, **J Thromb Haemost**, 2006, 4:1975-1981.

Laurens, N., Koolwijk, P., de Maat, M.P.M. Fibrin Structure and Wound Healing, J. Thrombosis Heamostas, 2006, 4:932-439.

Plasier, M., Koolwijk, P., Hanremaajier, R., Verwey, R.A., van der Weiden, R.M.F., Risse, E.K.J., Helmenhorst, F.M., van Hinsbergh, V.W.M. Membraner-Type Matrix Medlaproteinasse (Mr.J.M.Pe) in Human Endometrium during the Cycle. Association of MT2- and MT3-MMP with Endometrial Angiogenesis: \*Molecular Human Reproduction., 2006 12:11-8. Epub 2006 Jan 16.

Kapiteijn, K., Koolwijk, P., van der Weiden, R.M.F., van Nieuw Amerongen, G., Plaisier, M., van Hinsbergh, V.W.M., Helmerhorst, F.M. Human embryo-conditioned medium stimulate in vitro endometrial angiogenesis. Fertility & Sterility. 2006, 85 Suppl 1:1232-9.

#### 2005

van Hinsbergh V.W.M., Koolwiik P., Hoekman K. The hemostatic system in angiogenesis. EXS, 2005:(94):247-66.

Ponec, M., Ghalbzouri, A.E., Dijkman, R., Kempenaar, J., van der Pluijm, G., Koolwijk, P. Endothelial network formed with human dermal microvascular endothelial cells in autologous multicellular skin substitutes. Angiogenesis. 2004;7(4):295-305. Epub 2005 May 9.

Rookmasker MB, Verhaar MC, Loomans CJ, Verloop R, Peters E, Westerweel PE, Murchara T, Staal FJ, var Conneveld AJ, Konowijk P, Rabelink TJ, van Hinsbergh WW. CD344- Calls Home, Proliferate, and Participate in Capillary Formation, and in Combination With CD34- Cells Enhance Tube Formation in a 3-Dimensional Matrix. Arteriosc. Thromb. Vasc. Biol. 2005 25:1843-1850.

#### 2004

Plaisier, M., Kapiteljn, K., Koolwijk, P., Fijten, C., Hanemaaijer, H., Grimbergen, J.M., Mulder-Stapel, A., Quax, P.H.A., Helmerhorst, F.M., Van Hinsbergh, V.W.M. involvement of membrane type matrix, metalloproteinsses in capillary tube formation by human endometrial microvascular endothelial cells. Role of MT3-MMP. J. Clin. Endocrinol. Metabol., 2004, 89:5826-5836.

Sengupta, S., Toh, S-A., Sellers, L.A., Skepper, J.A., Koolwijk, P., Leung, H.W., Yeung, H-W., Wong, R.N.S., Sasisekharan, R., Fan, T-P. Modulating angiogenesis: the yin and the yang in ginseng. Circulation. 2004, 110:1219-1225.

Engelse, M.A., Hanemaaijer, R., Koolwijk, P. and Van Hinsbergh, V.W.M. The fibrinolytic system and matrix metalloproteinases in angiogenesis and tumor progression. Sem. Thromb. Res., 2004, 30:71-82.

# 2003

Bouis, D., Boelens, M.C., Peters, E., Koolwijk, P., Stob, G., Kema, I.P., Klinkenberg, M., Mulder, N.H., Hospers, G.A. Combination of Vascular Endothelial Growth Factor (VEGF) and Thymidine Phosphorylase (TP) to Improve Angiogenic Gene Therapy. Angiogenesis. 2003. 6:185-192

Van Hensbergen, Y., Broxterman, H.J. Peters, E., Rana, S., Elderkamp, Y.W., Pinedo, H.M., van Hinsbergh, V.W.M., Koolwijk, P. Aminopeptidase inhibitor bestatin stimulates microvascular endothelial cell invasion in a fibrin matrix. **Thromb. Haemost**. 2003, 90: 921-929.

Nguyen, M.T., Beck, J., Lue, H., Funtzig H., Kleemann, R., Koolwijk, P., Kapumiotu, A., Bernhagen, J. A sisteen residue peptide fragment of macrophage migration inhibitory factor, MIF(50-65), exhibit redox activity and has MIF-like biological functions. J. Biol. Chem. 2003 258: 3365-3367.

Kroon, M.E., van Schie, M.L.J., van der Vecht, B., van Hinsbergh V.W.M., Koolwijk, P. Collagen type 1 retards tube formation by human microvascular endothelial cells in a fibrin matrix. **Angiogenesis**. 2002;5(4):257-65.

Van Nieuw Amerongen, G.P., Koolwijk, P., Versteilen, A., van Hinsbergh V.W.M. Involvement of RhoA/Rho kinase-signalling in VEGF-induced endothelial cell migration and angiogenesis in vitro. Arteriosc. Thromb. Vasc. Biol. 2003. 23:211-217.

Collen, A., Hanemaaijer, R., Lupu, F., Quax, P.H.A., van Lent, N., Grimbergen, J., Peters, E., Koolwijk, P., van Hinsbergh, V.W.M.. Membrane-type matrix metalloproteinase mediated angiogenesis in a fibrin-collagen matrix. **Blood**. 2003, 101:1810-1817.

# 2001

Koolwijk, P., Kapiteijn, K., Molenaar, B., van Spronsen, E., van der Vecht, B., Helmerhorst, F., van Hinsbergh, V.W.M. Enhanced angiogenic capacity and urokinase-type plasminogen activator expression by endothelial cells isolated from human endometrium. J. Clin. Endocrinol. Metabol. 2001. 86:3359-3367.

Van Hinsbergh, V.W.M., Collen, A., Koolwijk, P., Role of fibrin matrix in angiogenesis. Ann. N. Y. Acad. Sci. 2001, 936: 426-437.

Koolwijk, P., Peters, E., van der Vecht, B., Hornig, C., Weich, H.A., Altital, K., Hicklin, D.J., Wu, Y., Witte, L., van Hinsbergh, V.M., Involvement of VEGFF-2 (kdrlik-1) but not VEGFF-1 (tit-1) in VEGF-A and VEGF-C-induced tube formation by human microvascular endothelial cells in librin matrices in vitro. Anglogenesis. 2001. 4:53-60.

Koolwijk, P., Sidenius, N., Peters, E., Sier, C.F.M., Hanemaaijer, R., Blasi, F., van Hinsbergh, V.W.M. Proteolysis of the u-PA receptor by MMP-12. Implication for angiogenesis in fibrin matrices. Blood. 2001, 97:3123-3131.

Kapiteijn, K., Koolwijk, P., Van der Weiden, R., Helmerhorst, F., Kooistra, T., Van Hinsbergh, V.W.M. Steroids and cytokines in endometrial andiogenesis. Anticancer Res. 2001, 21:4231-4242.

Papadimitriou, E., Polykratis, A., Giannopoulou E., Courty, J., Koolwijk, P., Katsoris, P. HARP induces angiogenesis in vivo and in vitro: Implication of N or C terminal peptides. Biochem. Biophys. Res. Commun. 2001. 282

Schulter V., Koolwijk P., Peters E., Frank S., Hrzenjak A., Graier W.F., van Hinsbergh V.W.M., Kostner, G.M. Impact of apolipoprotein(a) on in vitro angiogenesis. Arteriosc. Thromb. Vasc. Biol. 2001, 21:433-438.

Kroon, M.E., Koolwijk, P., van der Vecht, B., van Hinsbergh, VWM. Hypoxia in combination with FGF-2 induces tube formation by human microvascular endothelial cells in a fibrin matrix. Involvement of at least two signal transduction pathways. J. Cell Sci. 2001, 144.905-823.

Collen, A., Maas, A., Kooistra, T., Lupu, F., Grimbergen, J., Haas, F., Biesma, D., Koolwijk, P., Koopman J., van Hinsbergh, V.W.M. Aberrant fibrin formation and cross-linking of librinogen Nieuwegein, a variant with a shortened Accchain, alters endothelial capillary tube formation. **Blood.** 2001;97:973-980.

Kroon, M.E., Koolwijk, P., Vermeer, MA., van der Vecht, B., van Hinsbergh, V.W.M. Vascular endothelial growth factor enhances the expression of urokinase receptor in human endothelial cells via protein kinase C activation. Thromb. Haemost. 2001. 85:296-302.

#### 2000

Collen, A., Smorenburg, S.M., Peters, E., Lupu, F., Koolwijk, P., Van Noorden, C., van Hinsbergh, V.W.M., Unfractionated and low molecular weight heparin affect fibrin structure and angiogenesis in vitro. Cancer Res. 2000. 60:6196-6200.

Kroon, ME., Koolwijk, P., van der Vecht, B., van Hinsbergh, VWM. Urokinase receptor expression on human microvascular endothelial cells is increased by hypoxia; implications for capillary-like tube formation in a fibrin matrix. **Blood**. 2000. 96:2775-2783.

Manolopoulos, VG., Liekens, S., Koolwijk, P., Voets, T., Peters, E., Droogmans, G., Lelkes, Pl., De Clercq, E., Nilius, B. Inhibition of Angiogenesis by Blockers of Volume-Regulated Anion Channels. Gen. Pharmacol. The Vascular System. 2000, 34:107-116.

Koolwijk, P., Van Hinsbergh, V.W.M. Fibrin and proteolysis in repair-associated angiogenesis. In: Rubanyi, G.M. ed. Angiogenesis in health and disease, Basic mechanisms and clinical applications. New York: Marcel Dekker Inc. 2000. 261-280.

# 1999

Blaauwgeers, H.G.T, Holbsamp, G.M., Rutten, H., Witmer, A.N., Koolwijk, P., Partanen, T.A., Alfab, K., Koon, M.E., Kijstra, A., van Hinsbergh, V.W.M., and Schliegmann, R.D. Polatraci vascular endothelial growth factor seeration by human retinal pigment epithelium and localization of vascular endothelial growth factor receptors in the inner choriocapillaris. Evidence for a trophic paracraine relation. Am. J. Pathol. 1999, 15542414289.

Kroon, M.E., Koolwijk, P., Van Goor, H., Weidle, U.H., Collen, A., Van der Pluijm, G., and Van Hinsbergh, V.W.M. Role and localization of urokinase receptor in the formation of new microvascular structures in fibrin matrices. Am. J. Pathol. 1999, 154:1731-1742.

Van Hinsbergh, V.W.M., Koolwijk, P., Collen, A., Kroon, M.E., Hanemaaijer R., Verheijen, J.H., and Quax, P.H.A. Endothelial and smooth muscle plasminogen activators in fibrinolysis, coll migration and repair-associated angiogenesis. In: vascular endothelium: Mechanisms of cell signalling, Catravas, J.D., Ryan U.S., and Callow A.D. eds. Amsterdam: IOS press. 1999, 157-178

Van Hinsbergh, V.W.M., Collen, A., and Koolwijk, P. Angiogenesis and anti-angiogenesis: Perspectives for the treatment of solid tumors. Ann. of Oncology. 1999, 10 suppl. 4:S60-S63.

Koolwijk, P., Van Hinsbergh, V.W.M. Role of urokinase-type plasminogen activator (u-PA) in *in vitro* angiogenesis in fibrin matrices. In: Zilla, P., and Greisler, H. eds. Tissue-engineering of prosthetic vascular grafts. Austin: R.G. Landes Company. 1999, 313-320.

# 1998

Lansirk, M., Koolwijk, P., Van Hinsbergh, V.W.M., and Kooistra, T. Effect of steroid hormones and retinoids on the formation of capillary-like futbular structures of human microvascular endothelial cells in fibrin matrices is related to urokinase expression. **Blood**, 1989, 92:1927-1938.

Koolwijk, P., Hanemaaijer, R., and Van Hinsbergh, V.W.M. Proteases and angiogenesis. Regulation of plasminogen activators and matrix metallicproteases by endothelial cells. In: Maragoudakis ME, ed. Models, Modulators, and clinical applications. New York: Plenum Press. 1998. Series A: Life Sciences vol. A298 241-261

Giraudo, E., Primo, L., Audero, E., Gerber, H.P., Koolwijk, P., Soker, S., Klagsbrun, M., Ferrara, N., Bussolino, F. Tumor necrosis factor-alpha regulates expression of vascular endothelial growth factor receptor-2 and of its co-receptor neuropilin-1 in human vascular endothelial cells. J. Biol. Chem. 1998. 273: 22126-22135.

Collen, A., Koolwijk, P., Van Hinsbergh, V.W.M. Influence of fibrin structure on the formation and maintenance of capillary-like tubules by human microvascular endothelial cells. **Angiogenesis**, 1998, 2:153-165.

Hanemaaijer, R., Visser, H., Konttinen, Y., Koolwijk, P., and Verheijen, J.H. A novel and simple immunocapture assay for determination of gelatinase-B (MMP.) activities in biological fluids: Saliva from patients with Sjögren's syndrome contain increased latent and active Gelatinase-B levels. Matrix Biology, 1998, 17: 657-665.

Hanemaaijer, R., Visser, H., Koolwijk, P., Sorsa, T., Salo. T., Golub, L.M. and van Hinsbergh, V.W.M. (1998). Inhibition of MMP synthesis by doxycyclin and modified tetracyclines (CMTs) in human endothelial cells. Adv. Dental Research, 1998, 12:114-118.

#### 1997

van Hinsbergh V.W.M., Koolwijk P., Hanemaaijer R. Role of fibrin and plasminogen activators in repair-associated angiogenesis: in vitro studies with human endethelial cells. EXS. 1997:79:391-411.

#### 1006

Koolwijk, P., Van Erck, M.G.M., De Vree, W.J.A., Vermeer, M.A., Weich, H.A., Hanemaaijer, R., Van Hinsbergh, V.W.M. Cooperative effect of TNFq, bFGF and VEGF on the formation of tubular structures of human microvascular endothelial cells in a fibrin matrix. Role of urokinase activity. J. Cell Biol. 1996. 132:177-1188.

Kooistra, T., Lansink, M., Van Kesteren, P., Koolwijk, P., Toet, K., Peters, E., Hegeman, R., Emeis, J., Stehouwer, C., Gooren, L., Van Hinsbergh, V.W.M. Effects of steroid hormones on the secretion of haemostatic factors in and angiogenic properties of human vascular endothelial cells. **Synecol. Endocrinol.** 1996. 10, sucol. 2:105-110.

Van Hinsbergh, V.W.M., Koolwijk, P., Hanemaaijer, R. Role of fibrin and plasminogen activators in Repair-associated angiogenesis. In vitro studies with human endothelial cells. In: I.D. Goldberg, E. Rosen, eds. Regulation of angiogenesis. 1996, 391-411.

Van Hinsbergh, V.W.M., Koolwijk, P., Hanemaaijer, R. Plasminogen activators in fibrinolysis and pericellular proteolysis. Studies on human endothelial cells in vitro In: Maragoudakis ME, ed. Molecular, cellular, and clinical aspects of angiogenesis. New York: Plenum 1986, 37-49.

Quax, P.H.A., Koolwijk, P., Verheijen, J.H., Van Hinsbergh, V.W.M. Role of plasminogen activators in vascular pericellular proteolysis. In: V.W.M. Van Hinsbergh, ed. Vascular control of hemostasis, Harwood Acad. Publ. 1996, 227-245.

Hanemaaijer, R., Visser, H., Koolwijk, P., Sorsa, T., Salo, T., Golub, L.M., Van Hinsbergh, V.W.M. Down-regulation of gelatinase B activity and synthesis by doxycyclin in human endothelial cells. J. Dental Res. 1996. 75:107.

# 1995

Koolwijk, P., Miltenburg, A.M.M., Van Erck, M.G.M., Oudshoorn, M., Niedbala, M.J., Breedveld, F.C., Van Hinsbergh, V.W.M. Activated gelatinases (MMP-9) and uchinase-type plasminogen activator (u-PA) in synovial fluids of arthritis patients. Correlation with clinical and experimental parameters of inflammation. J. Rheumatol. 1995, 22:385-393.

Van Boheemen, P.A., Van den Hoogen, C.M., Koolwijk, P. Comparison of the inhibition of urokinase-type plasminogen activator (u-PA) activity by monoclonal antibodies specific for u-PA as assessed by different assays. Fibrinolysis. 1995, 9:343-349.

# 1994

Koolwijk, P., De Vree, W.J.A., Zurcher, C., Van Hinsbergh, V.W.M. bFGF and TNFα cooperate in the formation of tubular structures of human endothelial cells in an *in witro* angiogenesis system. In: Maragoudakis ME, Gullino P, Leikes PI, eds. Angiogenesis: Molecular biology. clinical associs. New York: Plenum. 1994. 348.

Van Hinsbergh, V.W.M., Vermeer, M., Koolwijk, P., Grimbergen, J., Kooistra, T. Genistein reduces tumor necrosis factor alphainduced plasminogen activator inhibitor-1 transcription but not urokinase expression in human endothelial cells. Blood 1994, 84:2984-2991.

Van Hinsbergh, V.W.M., Hanemaaijer, R., Koolwijk, P. The endothelial plasminogen activator system: Pathophysiological modulation. In: Maragoudakis ME, Gullino P, Lelkes PI, eds. Angiogenesis: Molecular biology, clinical aspects. New York: Plenum, 1994. 171-181.

# 1002

Hanemaaijer R., Koolwijk P., Le Clercq L., De Vree W.J.A., van Hinsbergh V.W.M. Regulation of matrix-metalloproteinases (MMPs). Expression in human vein and microvascular endothelial cells. Effects of TNFc, IL-1 and phorbol ester. Biochem. J. 1993, 208-209-200.

Van Hinsbergh, V.W.M., Kooistra, T., Koolwijk, P. The Vascular Fibrinolytic System - Pathophysiological Modulation. Fibrinolysis 1993. 7:11-13.

Van Hinsbergh, V.W.M., Kooistra, T., Erneis, J.J., Koolwijk, P. Regulation of plasminogen activator synthesis by endothelial cells. Role in fibrinolysis and local proteolysis. Int. J. Radiation Biology. 1991. 60:261-272.

# Patent 2003:

PCT: Modification of the properties of a fibrin matrix with respect to growth and ingrowth of cells.

Dear members of the Organizing Committee, der friends,

it is a pleasure for us to confirm to you that the Council and the General Assembly of the International Society for Fibrinolysis and Proteolysis has officially accepted our proposal to host the XXM Congress of the International Society for Fibrinolysis and Proteolysis in Vienna from July 6-10, 2008. We would like to express our sincere thanks to you for your willingness to support us in the organization of this important event. We will keep our informed of our progress. Kindest requards

Johann Wojta (President Elect) Kurt Huber (Vicepresident Elect)